

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2003-030256

(43)Date of publication of application : 31.01.2003

(51)Int.Cl.

G06F 17/50
G06F 12/00

(21)Application number : 2001-216485

(71)Applicant : MITSUBISHI ELECTRIC CORP

(22)Date of filing : 17.07.2001

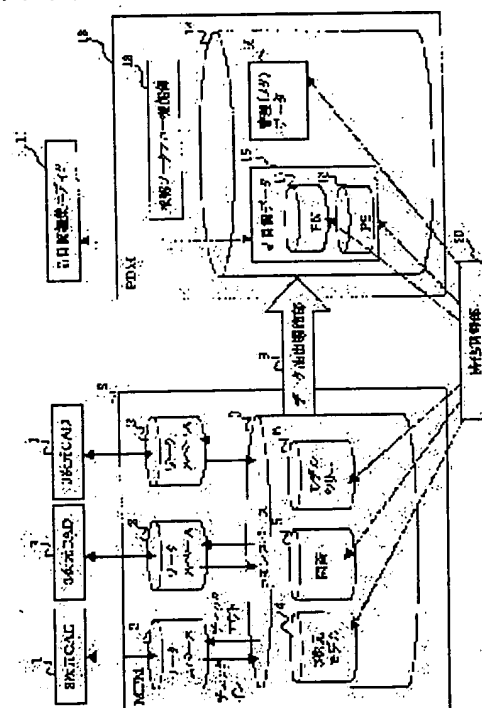
(72)Inventor : KATSUYAMA TSUNEKICHI

(54) DEVICE, METHOD AND PROGRAM FOR MANAGING PRODUCT INFORMATION AND RECORDING MEDIUM RECORDED WITH PRODUCT INFORMATION MANAGEMENT PROGRAM

(57)Abstract:

PROBLEM TO BE SOLVED: To maintain the consistency of product information having a three-dimensional model 4, a drawing 5 and item field data 15.

SOLUTION: When access requests are made to any of the three-dimensional model 4, the drawing 5 corresponded to the model 4 and the item field data 15 for design, a controlling part accepts one access request and performs processing that inhibits the other access requests from accessing the three-dimensional model 4, the drawing 5 and the item field data 15 in order to connect an MDM system for managing the three-dimensional model 4 showing a three-dimensional structure composed of one or more parts and the two-dimensional drawing 5 corresponding to the three-dimensional model 4 to a PDM system for managing information about one or more parts of the three-dimensional model 4 as the item field data 15 and to perform design processing while maintaining the consistency of objects (three-dimensional model 4, drawing 5 and item field data 15).



LEGAL STATUS

[Date of request for examination]

17.07.2001

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision
of rejection]

[Date of extinction of right]

Copyright (C); 1998,2003 Japan Patent Office

* NOTICES *

JPO and NCIPJ are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1] The structure information storage section which memorizes the two-dimensional drawing corresponding to the three-dimension model and three-dimension model in which the structure of the three dimension which consists of one or more components was shown on a structure table, The item information storage section memorized on an item table by making into item information information about one or more components of the three-dimension model which the above-mentioned structure information storage section memorizes, Access is accepted to the access request of 1 accessed for a design of either of the item information which the three-dimension model, the drawing, and the above-mentioned item information storage section which the above-mentioned structure information storage section memorizes memorize. Product information management equipment characterized by having the exclusive control section which forbids accessing for a design of the item information which the three-dimension model, the drawing, and the above-mentioned item information storage section which the above-mentioned structure information storage section memorizes to other access requests memorize.

[Claim 2] The above-mentioned exclusive-control section is product information-management equipment according to claim 1 characterized by the thing which access for a design of the item information corresponding to the object of an access request among the item [which access for a design of the three-dimension model which the above-mentioned structure information-storage section memorizes, the three-dimension model corresponding to the object of an access request among drawings, and a drawing / which carry out thing prohibition] information which the above-mentioned item information-storage section memorizes, and do for thing prohibition to an access request besides the above.

[Claim 3] After accessing the above-mentioned exclusive control section for a design of either of the item information which the three-dimension model, the drawing, and the above-mentioned item information storage section which the above-mentioned structure information storage section memorizes memorize, Product information management equipment according to claim 1 characterized by forbidding accessing for a design of the item information which the three-dimension model, the drawing, and the above-mentioned item information storage section which the above-mentioned structure information storage section memorizes memorize when an inspection demand is made.

[Claim 4] The above-mentioned exclusive-control section is product information-management equipment according to claim 3 carry out the thing access for the design by the item information corresponding to the object of an inspection demand among the item [which access for a design of the three-dimension model which the above-mentioned structure information-storage section memorizes, the three-dimension model corresponding to the object of an inspection demand among drawings, and a drawing / which carry out thing prohibition] information which the above-mentioned item information-storage section memorizes, and do for thing prohibition as the description to the above-mentioned inspection demand.

[Claim 5] The above-mentioned exclusive-control section is product information-management equipment according to claim 3 characterized by to admit accessing for a design of the item information which the three-dimension model, the drawing, and the above-mentioned item information-storage section which the above-mentioned structure information-storage section memorizes memorize in the case where the inspection to the

above-mentioned inspection demand is completed, or when there being cancellation of an inspection demand.

[Claim 6] The two-dimensional drawing corresponding to the three-dimension model and three-dimension model in which the structure of the three dimension which consists of one or more components was shown is memorized on a structure table. It memorizes on an item table by making into item information information about one or more components of the three-dimension model which the above-mentioned structure table memorizes. Access is accepted to the access request of 1 accessed for a design of either of the item information which the three-dimension model and drawing which the above-mentioned structure table memorizes, and the above-mentioned item table memorize. The product information management approach characterized by forbidding accessing for a design of the item information which the three-dimension model and drawing which the above-mentioned structure table memorizes to other access requests, and the above-mentioned item table memorize.

[Claim 7] The processing which memorizes the two-dimensional drawing corresponding to the three-dimension model and three-dimension model in which the structure of the three dimension which consists of one or more components was shown on a structure table, The processing memorized on an item table by making into item information information about one or more components of the three-dimension model which the above-mentioned structure table memorizes, Access is accepted to the access request of 1 accessed for a design of either of the item information which the three-dimension model and drawing which the above-mentioned structure table memorizes, and the above-mentioned item table memorize. The product information management program characterized by the processing which forbids accessing for a design of the item information which the three-dimension model and drawing which the above-mentioned structure table memorizes to other access requests, and the above-mentioned item table memorize.

[Claim 8] The processing which memorizes the two-dimensional drawing corresponding to the three-dimension model and three-dimension model in which the structure of the three dimension which consists of one or more components was shown on a structure table, The processing memorized on an item table by making into item information information about one or more components of the three-dimension model which the above-mentioned structure table memorizes, Access is accepted to the access request of 1 accessed for a design of either of the item information which the three-dimension model and drawing which the above-mentioned structure table memorizes, and the above-mentioned item table memorize. The record medium which recorded the product information management program characterized by the processing which forbids accessing for a design of the item information which the three-dimension model and drawing which the above-mentioned structure table memorizes to other access requests, and the above-mentioned item table memorize and in which computer reading is possible.

[Translation done.]

* NOTICES *

JPO and NCIP are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the product information management equipment for maintaining the consistency of the drawing corresponding to a three-dimension model and a three-dimension model, and item information, and its approach.

[0002]

[Description of the Prior Art] Conventionally, in the design site of a manufacture, the product architect expressed the configuration and the dimension of the product as a two-dimensional drawing, and defines the bill of materials of the product as the item column on a drawing further. With the spread of computers, the product data management system (PDM:PRODUCT DATA MANAGEMENT) which manages a design result object at large as not paper but electronic data not only including a drawing but including electronic forms, such as a bill of materials, was realized, and the data of this item column have also been managed as "forward" by the PDM system in the design site. Here, "forward" means the data (usually newest) which an architect should make the object of a design. And in order to produce actually the drawing managed by this PDM system, and the product based on the data of the item column, the structure electronically transmitted to a down-stream production control system has been built. On this structure, GUI (GRAPHICAL USER INTERFACE) which inputs item column data is offered by the PDM system, an architect does not do a data input to the item column on a direct drawing, but data are inputted via this GUI, it is once held at PDM, and the method which sticks that item column data on a drawing electronically is realized. It is for protecting about this merit pouring the data which were mistaken by offering edit exchange functions, such as a function to carry out the automatic check of the mistaken components information not only in improvement in a throughput but in the item column input GUI, and to take out warning (warning), and a function which complements the components information on other only with putting in the part number automatically, to a down-stream production control system.

[0003] However, in case the point which serves as a technical problem by this structure has a design change, I hear that it is necessary to carry out data control of it, and there is so that mismatching may not occur by making drawing information and item column data into a couple. as the case where mismatching occurs -- an architect -- the example which the 3rd person edits a drawing by another reason, and mismatching cuts while a principal edits item column data, and its objection -- an architect -- while a principal edits a drawing, there is an example which the 3rd person edits item column data by another reason, and mismatching cuts. Since such a problem is coped with, the exclusive control function of an access privilege has been realized in the conventional PDM system. During drawing edit, this function is a function locked reversely [that] so that, as for under item column data editing, the others cannot access the drawing corresponding to it in lock **** so that the others cannot access the item column corresponding to it. Thus, by controlling exclusively, a drawing and the item column data corresponding to 1 to 1 have been managed as a pair.

[0004]

[Problem(s) to be Solved by the Invention] the three-dimension model for the complicated DS of a three dimension since it is necessary with the spread of three dimensional CAD (COMPUTER AIDED DESIGN) in

recent years to set and manage not only a drawing but a three-dimension model on the other hand -- and -- and the system which can manage the drawing generated is needed. There is a three-dimensional-CAD data management system which manages the three-dimension model, drawing, a model tree, etc. (layered structure of a three-dimension model) called MDM (MODEL DATA MANAGEMENT) as the system. Then, it is possible to extract the model building tree data (model tree) of the three-dimension model which a MDM system manages, to divert the model tree by the PDM system side, and to relate with item column data by building the system which made the PDM system which existed from the former, and the MDM system cooperate.

[0005] however, in case the point which serve as a technical problem by the system which made this MDM system and a PDM system cooperate have a design change, I hear that it be necessary to carry out data control of it, and there be so that mismatching may not occur by make into a couple the item column data manage by the three dimension model [which be manage by the MDM system side], and information [on a drawing] and PDM system side. Since the exclusive control function of the access privilege of only the conventional drawing is what is simply realized [have / I / you] unitary by the single PDM system as described above, it does not have the exclusive control function of an access privilege in the system which made the PDM system and the MDM system cooperate. Therefore, when premised on three dimensional CAD, it becomes a technical problem to realize the exclusive control function of an access privilege when the complicated relation of the item column data managed by the three-dimension model and drawing, and PDM system side has been grasped. [which are managed by the MDM system side]

[0006] This invention aims at maintaining the consistency of the product information which has a three-dimension model, a drawing, and item information.

[0007]

[Means for Solving the Problem] In order to attain the above-mentioned object, the product information management equipment which is this invention The structure information storage section which memorizes the two-dimensional drawing corresponding to the three-dimension model and three-dimension model in which the structure of the three dimension which consists of one or more components was shown on a structure table, The item information storage section memorized on an item table by making into item information information about one or more components of the three-dimension model which the above-mentioned structure information storage section memorizes, Access is accepted to the access request of 1 accessed for a design of either of the item information which the three-dimension model, the drawing, and the above-mentioned item information storage section which the above-mentioned structure information storage section memorizes memorize. It is characterized by having the exclusive control section which forbids accessing for a design of the item information which the three-dimension model, the drawing, and the above-mentioned item information storage section which the above-mentioned structure information storage section memorizes to other access requests memorize.

[0008] Moreover, the above-mentioned exclusive-control section is characterized by the thing which access for a design of the item information corresponding to the object of an access request among the item [which are accessed for a design of the three-dimension model which the above-mentioned structure information-storage section memorizes, the three-dimension model corresponding to the object of an access request among drawings, and a drawing / which carry out thing prohibition] information which the above-mentioned item information-storage section memorizes and do for thing prohibition to an access request besides the above.

[0009] Moreover, the above-mentioned exclusive-control section is characterized by to forbid accessing for a design of the item information which the three-dimension model, the drawing, and the above-mentioned item information-storage section which the above-mentioned structure information-storage section memorizes memorize, when an inspection demand is made after accessing for a design of either of the item information which the three-dimension model, the drawing, and the above-mentioned item information-storage section which the above-mentioned structure information-storage section memorizes memorize.

[0010] Moreover, the above-mentioned exclusive-control section carries out the thing access for the design by the item information corresponding to the object of an inspection demand among the item [which access for a design of the three-dimension model which the above-mentioned structure information-storage section

memorizes, the three-dimension model corresponding to the object of an inspection demand among drawings, and a drawing / which carry out thing prohibition] information which the above-mentioned item information-storage section memorizes and do for thing prohibition as the description to the above-mentioned inspection demand.

[0011] Moreover, the above-mentioned exclusive control section is characterized by admitting accessing for a design of the item information which the three-dimension model, the drawing, and the above-mentioned item information storage section which the above-mentioned structure information storage section memorizes memorize in the case where the inspection to the above-mentioned inspection demand is completed, or when there being cancellation of an inspection demand.

[0012] Moreover, the product information management approach of this invention memorizes the two-dimensional drawing corresponding to the three-dimension model and three-dimension model in which the structure of the three dimension which consists of one or more components was shown on a structure table. It memorizes on an item table by making into item information information about one or more components of the three-dimension model which the above-mentioned structure table memorizes. Access is accepted to the access request of 1 accessed for a design of either of the item information which the three-dimension model and drawing which the above-mentioned structure table memorizes, and the above-mentioned item table memorize. It is characterized by forbidding accessing for a design of the item information which the three-dimension model and drawing which the above-mentioned structure table memorizes to other access requests, and the above-mentioned item table memorize.

[0013] Moreover, the processing which memorizes the two-dimensional drawing corresponding to the three-dimension model and three-dimension model in which the structure of a three dimension where the product information management program of this invention consisted of one or more components was shown on a structure table, The processing memorized on an item table by making into item information information about one or more components of the three-dimension model which the above-mentioned structure table memorizes, Access is accepted to the access request of 1 accessed for a design of either of the item information which the three-dimension model and drawing which the above-mentioned structure table memorizes, and the above-mentioned item table memorize. It is characterized by making a computer perform processing which forbids accessing for a design of the item information which the three-dimension model and drawing which the above-mentioned structure table memorizes to other access requests, and the above-mentioned item table memorize.

[0014] Moreover, the record medium which recorded the product information management program of this invention and in which computer reading is possible The processing which memorizes the two-dimensional drawing corresponding to the three-dimension model and three-dimension model in which the structure of the three dimension which consists of one or more components was shown on a structure table, The processing memorized on an item table by making into item information information about one or more components of the three-dimension model which the above-mentioned structure table memorizes, Access is accepted to the access request of 1 accessed for a design of either of the item information which the three-dimension model and drawing which the above-mentioned structure table memorizes, and the above-mentioned item table memorize. It is characterized by recording the product information management program which makes a computer perform processing which forbids accessing for a design of the item information which the three-dimension model and drawing which the above-mentioned structure table memorizes to other access requests, and the above-mentioned item table memorize.

[0015]
[Embodiment of the Invention] As the above-mentioned publication, conventionally, by inputting the item column data which are the bill of materials of the drawing created in a design category from the dedication GUI of a PDM system, it was managed unitary by the bill-of-materials function manager, and stuck on the drawing automatically as an item column after that, and the link to down-stream systems, such as a production control system, etc. was realized simultaneously. In the actual condition that a three-dimensional-CAD design spreads, as a form of the item column data which become the origin of production information, the model tree of three dimensional CAD 1 is diverted, item column data are completed by adding a missing component

required for arrangement etc. to item column data, and carrier delivery of the consistent electronic data to a down-stream system is realized. Design increase in efficiency is attained by offering edit exchange functions, like saving the time and effort of an input, and edit of the item column data on this structure prevents an input mistake. However, it sets in the condition that the item column data once created newly are held at PDM. When the correction for a design change joins a three-dimension model and a drawing, the 3rd person corrects the item column data in a PDM system for the another object. Or when the correction for a design change joined item column data, the 3rd person corrected the three-dimension model and the drawing in a MDM system to the reverse for the another object, and the problem which the mismatching of data generates was in it. In order to solve such a problem, it controls exclusively by the gestalt of operation as follows, and the consistency of the information on a PDM system and a MDM system is held with it.

[0016] gestalt 1. of operation -- the gestalt 1 of operation is explained first. In the three-dimensional-CAD data management system shown in drawing 1, MDM8 consists of a common space 3 (forward data sharing field) and a workspace 2 (each one of working areas). A common space 3 is an example of a structure table which memorizes the two-dimensional drawing 5 corresponding to the three-dimension model 4 and the three-dimension model 4 in which the structure of the three dimension which consists of one or more components was shown. A three-dimensional-CAD architect performs an input using three dimensional CAD 1, and carries out a three-dimensional-CAD design by making one's workspace 2 into a working area. The three-dimension model 4 in the event of a three-dimension design being completed and an example of a drawing 5 are shown in drawing 2. An architect makes the three-dimension model 4 on his workspace 2 check in at the three-dimension model 4 of a common space 3, and makes the drawing 5 on his workspace 2 check in at the drawing 5 of a common space 3. Here, it says that the check-in shown in drawing 1 moves data to a common space 3 (share data area) from a workspace 2 (each one of working areas). Moreover, it says that the check-out shown in drawing 1 moves data to a workspace 2 (each one of working areas) from a common space 3 (share data area). The model tree 6 generated from the three-dimension model 4, or the drawing 5 and the three-dimension model 4 at which he checked in is held as forward data at a common space 3. The example of the model tree 6 generated by drawing 2 from the three-dimension model 4, the drawing 5, and the three-dimension model 4 is given. As for the data on a common space 3, the access control is performed by setting out of an access privilege being made by every user's (user) authority.

[0017] On the other hand, the management (meta) information 16 on the data of the three-dimension model 4 and drawing 5 in MDM8 or the data of the item information in PDM12 is held at the database 14 in PDM12. Although the attribute of data, a semantic content, a customer, a storing location, etc. say the information for managing data in the managed (meta) data 16, in this system, the address of a three-dimension model name, a drawing name, the file name that memorized the three-dimension model 4 and the drawing 5, and a physical file location folder, an architect name, a design date and an acknowledgement person name, an acknowledgement date, etc. correspond, for example. Moreover, the item column data 15 with the item information which showed the information about one or more components of the three-dimension model 4 memorized by the common space which is an example of a structure table to the database 14 in PDM12 are held. This item column data 15 is an example of an item table. Moreover, the item information on this item column data 15 consists of one hierarchy who has the relation between parents and a child, and can be edited by the item column edit editor 11. Using the data extraction function part 9, the data extracted from the model tree 6 of MDM8 were incorporated as initial value at the time of edit, and the item column edit editor 11 has diverted them. This item column edit editor 11 may exist independently, as shown in drawing 1, and although not illustrated, it may exist as a function on PDM12. Moreover, the item column data 15 in PDM12 are constituted by the components information (PARTS STRUCTURE) PN 17 and the components configuration information (PARTS NUMBER) PS 18. Moreover, the **** workflow function part 13 of PDM12 has the function which inspects and attests the three-dimension model 4 and drawing 5 which were designed when there was a **** (inspection and authentication) demand from an architect, and the item column data 15.

[0018] The case where an architect checks out the three-dimension model 4 or drawing 5 of a common space 3 on MDM8 to a workspace 2, and the exclusive control section 20 changes these contents, When writing is put into the item column data 15 in which the item information on PDM12 is shown, Or when an architect

requests **** (inspection and authentication) of either the above-mentioned three-dimension model 4, a drawing 5 and the item column data 15, other architects and users have the function to forbid writing in the three-dimension model 4, a drawing 5, and the item column data 15. Moreover, the exclusive control section 20 has the function to cancel the prohibition on the writing to the three-dimension model 4, a drawing 5, and the item column data 15 to other architects and users, when termination of **** is checked, and when cancellation of a **** request is checked. Thus, the exclusive control section 20 can maintain the consistency of the three-dimension model 4 of MDM8, a drawing 5, the model tree 6, and the item column data 15 on PDM12 by controlling exclusively.

[0019] Next, each actuation (1) – (8) shown in drawing 3 is concretely explained about by what kind of flow, among the whole configurations shown by above-mentioned drawing 1, how, the data extraction function part 9 functions, and the item column data 15 are edited.

- (1) Generate the model tree 6 from the three-dimension model 4 designed by three dimensional CAD 1. The image 29 in MDM8 shown in drawing 3 is an example of the model tree 6.
- (2) The model tree 6 on MDM8 is extracted on PDM12 using the data extraction function part 9. The image 30 in PDM12 after the data extraction shown in drawing 3 is an example of the extracted model tree 6, and is the same content as an image 29.
- (3) By the item column edit editor 11, divert the extracted model tree 6 as a form, and edit the item column data 15.
- (4) Save the item column data 15 after edit at PDM12.
- (5) In correcting the item column data 15, the item column data 15 are read into the item column edit editor 11 from PDM12, and it performs a reorganization collection.
- (6) Stick the edit result by the item column edit editor 11 as an item column 27 on the drawing 5 of three dimensional CAD 1.
- (7) Moreover, the three-dimension viewdata and the link of a graphics server (not shown) where the model tree 6 in PDM12 manages three-dimension viewdata separately are stretched. It is for the third party who wants to check the content of a design to refer to easily the three-dimension model 4, a drawing 5, and the item column data 15.
- (8) Moreover, the item column data 15 (PN17/PS18) which edit completed are linked to the down-stream production control system.

[0020] Below, drawing 4 is explained. The **** workflow function part 13 holds the release level of drawing 4, and it is shown whether the three-dimension model 4, a drawing 5, and the item column data 15 are in which condition. When release level "is creating", level 1 and release level "are **** requesting" for example, and level 2 and release level are "finishing [****]", it is possible to manage like level 3 with the **** workflow function part 13. In the case of the condition in the middle of designing the three-dimension model 4, a drawing 5, or the item column data 15, release level becomes "under creation." A design is completed and release level becomes "under a **** request" the case in the condition that the object (the three-dimension model 4, a drawing 5, item column data 15) is supplied to the **** workflow function part 13. Ending the inspection authentication by the **** workflow function part 13, release level becomes "finishing [****]" the case in the condition, finishing [a release].

[0021] Drawing 5 is drawing showing the timing as which the **** workflow function part 13 determines release level. After creating the three-dimension model 4, a drawing 5, or the item column data 15 and ending creation, an architect supplies an object to the **** workflow function part 13. Then, the **** workflow function part 13 carries out release level "during a **** request." Release level will become "finishing [****]", if inspection and authentication are completed by the **** workflow function part 13 and it will be in the condition of **** O.K. In reforming the three-dimension models 4, such as setting-out modification, a drawing 5; or the item column data 15, in order to borrow an object [finishing / a release], release level becomes "under creation." Moreover, when there is a cancellation request of the object supplied on the **** workflow function part 13 when release level had become "under the **** request", release level becomes "under creation" "out of a **** request."

[0022] Next, concrete actuation of the exclusive control section 20 is explained. Drawing 6 is the flow chart

which showed actuation of the exclusive control section 20 at the time of correcting the three-dimension model 4 and a drawing 5. As shown in drawing 6, in case he checks out a common space 3 and the three-dimension model 4 and a drawing 5 are corrected in a workspace 2 by MDM8, as shown in drawing 4, I am checked out as "under creation" in the release level of an object. That is, as shown in drawing 5, an object [finishing / a release] is borrowed from a common space 3 in a workspace 2, and a design change is performed by correcting the data in a workspace 2. When temporarily checked out with the condition of "finishing [****]" which release level shows to drawing 5, there is no correction and it is judged as the object of only reference. When it is judged that a correction act is performed after borrowing an object [finishing / a release / for the case of the former, i.e., amendment,], the exclusive control section 20 goes the managed (meta) data 16 of the object to PDM12 to search by making the action [say / having checked out object data from the common space 3 (forward data sharing field) of MDM8 to the workspace 2 (each one of working areas)] into a trigger. and the item column data 15 corresponding to the object -- a lock -- applying -- an architect -- a principal -- by the item column edit editor 11, except cannot correct the item column data 15, and carries out it. Thus, also in the three-dimensional-CAD managerial system in which the exclusive control section 20 has complicated DS by controlling exclusively, other architects can be forbidden from correcting freely the item column data 15 on PDM12 during correction of the three-dimension model 4 and a drawing 5, and the consistency of each data (three-dimension model 4, drawing 5, and item column data 15) with which it is related on a three-dimensional-CAD managerial system can be maintained. It becomes possible to utilize three-dimension model 4, drawing 5, and the item column data 15 with which forward was guaranteed by the newest in an instant by this doubling not only with the conventional mere data transmission but with design operation cooperation between the three-dimension data management system MDM8 in a three-dimensional-CAD design, and PDM12 which manages down-stream arrangement data, and realizing implementation of consistency maintenance of various data. Therefore, if this cooperation system of MDM8 and PDM12 is used, upgrading of design operation (a three-dimensional-CAD design and arrangement directions operation) and activity increase in efficiency are realizable.

[0023] Drawing 7 is the flow chart which showed actuation of the exclusive control section 20 at the time of correcting the item column data 15 using the item column edit editor 11. As drawing 7 shows, in case the item column data 15 are corrected by the item column edit editor 11 in PDM12, it makes to start the item column editor edit 11 into a trigger (cause). The exclusive control section 20 goes the managed (meta) data 16 of the corresponding item column data 15 to PDM12 to search. the three-dimension model 4 and drawing 5 in corresponding MDM8 -- a lock -- applying -- an architect -- a principal -- except cannot check out a common space 3 and carries out the three-dimension model 4 and a drawing 5. Thus, also in the three-dimensional-CAD managerial system in which the exclusive control section 20 has complicated DS by controlling exclusively, other architects can be forbidden from correcting freely the three-dimension model 4 and drawing 5 on MDM8 during correction of the item column data 15, and the consistency of each data (three-dimension model 4, drawing 5, and item column data 15) with which it is related on a three-dimensional-CAD managerial system can be maintained.

[0024] Drawing 8 is the flow chart which showed the actuation which the exclusive control section 20 performs, when release level is **** requesting. Here, as release level shows drawing 4 R> 4 during a **** request, a design is completed and the condition that the object is supplied to the **** workflow function part 13 is said. Moreover, an object here means the three-dimension model 4, a drawing 5, or the item column data 15. In MDM8, the architect who made correction throws the managed (meta) data 16 of an object used as a **** object into the **** workflow function part 13 on PDM12 after the completion of correction of the item column data 15 after the completion of correction of the three-dimension model 4 or a drawing 5, or in PDM12. By this data charge, release level becomes "a **** request" and the exclusive control section 20 specifies the three-dimension model 4, the drawing 5, and the item column data 15 which are linked to the managed (meta) data 16 of an object used as the supplied **** object by making this "**** request" (= data charge) into a trigger (cause). And a lock is covered over the three-dimension model 4 and drawing 5 on specified MDM8, he cannot check out a common space 3 and the three-dimension model 4 and a drawing 5 are carried out. Moreover, a lock is covered also over the item column data 15 on specified PDM12. It

becomes impossible thus, for nobody to correct including the architect itself because the exclusive control section 20 covers a lock over the three-dimension model 4, a drawing 5, or the item column data 15. Thus, at the time of a **** request, also in a three-dimensional-CAD managerial system with complicated DS, the exclusive control section 20 can maintain the consistency of the three-dimension model 4 of MDM8, a drawing 5, the model tree 6, and the item column data 15 on PDM12, and can perform an exact production control by controlling exclusively so that nobody can correct the object for ****.

[0025] Drawing 9 is the flow chart with which the **** workflow function part 13 showed the actuation which the exclusive control section 20 performs when **** request cancellation occurred in ****, or when release level became **** ending. As drawing 9 shows, when release level becomes [the **** workflow function part 13 on PDM12] "finishing [****]" into ****, Or carry out **** request cancellation by the architect (**** client), processing is performed, and the action is made into a trigger when release level becomes "under creation", as shown in drawing 5. The exclusive control section 20 cancels the lock of the three-dimension model 4, the drawing 5, and the item column data 15 of PDM12 used as a **** object. Thus, when release level becomes "finishing [****]", a refer right can be granted to all men because the exclusive control section 20 controls exclusively. moreover, the case where release level becomes "under creation" -- an implementer (architect) -- an access privilege (a refer right and right of correction) can be granted only to a principal.

[0026] Gestalt 2. of operation, next the gestalt 2 of operation are explained. Although drawing 10 is the almost same system configuration as the three-dimensional-CAD data management system shown in drawing 1, a exclusive control function distributes in MDM8 and PDM12, and it exists. That is, the structure exclusive control section 7 exists on MDM8, and the item exclusive control section 19 exists on PDM12. Moreover, the exclusive control cooperation function part 10 with the function to take the timing which considers exclusive control as the function to specify the object of exclusive control has joined the component. The above structure exclusive control section 7, item exclusive control section 19, and exclusive control cooperation function part 10 are performing the same control as the exclusive control section 20 of the gestalt 1 of operation. Other configurations are the same as the configuration of drawing 1. The structure exclusive control section 7 has the function to lock or cancel the data held at the three-dimension model 4, the drawing 5, and the model tree 6 on a common space 3, and controls an access privilege by this. Moreover, the item exclusive control section 19 has the function to lock or cancel the data held at the PN data 17 and the PS data 18 of the item column data 15, and controls an access privilege by this. The exclusive control cooperation function part 10 moreover, at the time of a design change A design-change object is specified using the managed (meta) data 16 which held the relation of the three-dimension model 4 in MDM8, a drawing 5, and the item column data 15 in PDM12 as information. When correction starts three-dimension model 4 and the drawing 5 in MDM8, the timing and the user actuation trigger for starting the processing which covers a lock over the item column data 15 in PDM12 are clarified, and it has a cooperation function for realizing a series of processings in an operation flow. Moreover, when correction starts the item column data 15 in PDM12, the timing and the user actuation trigger for starting the processing which covers a lock over three-dimension model 4 and the drawing 5 in MDM8 are clarified, and it has a cooperation function for realizing a series of processings in an operation flow. Moreover, at the time of a **** request, if the managed (meta) data 16 of the three-dimension model 4, a drawing 5, or the item column data 15 are made into **** written request voice within PDM12 The three-dimension model 4, the drawing 5, and the item column data 15 which are set as the **** objects, such as the three-dimension model 4 and drawing 5 of MDM8, and the item column data 15 of PDM12, are locked. The timing and the user actuation trigger for starting the processing which controls the others' access exclusively are clarified, and it has a cooperation function for realizing a series of processings in an operation flow. Moreover, the timing and the user actuation trigger for starting the processing which carries out automatic removal of the lock of the after [**** termination] or three-dimension model 4 which **** request cancellation is carried out and is data for **** behind, a drawing 5, or the item column data 15 are clarified, and it has a cooperation function for realizing a series of processings in an operation flow.

[0027] Concrete actuation of exclusive control is explained. With the gestalt 2 of operation, the item exclusive

control section 19 is performing exclusive control at the time of correcting the three-dimension model 4 and drawing 5 which are shown in drawing 6 . Namely, as shown in drawing 6 , when you check out a common space 3 and the three-dimension model 4 and a drawing 5 are corrected in a workspace 2 by MDM8, When it is judged that he checks out an object [finishing / a release] from a common space 3 to a workspace 2, and a correction act is performed, the exclusive control cooperation function part 10 The item column data 15 which serve as a design-change object using the managed (meta) data 16 are specified. The action [say / having checked out object data from the common space 3 (forward data sharing field) of MDM8 to the workspace 2 (each one of working areas)] is made into a trigger. The specified item column data 15 over which the processing instruction over which a lock is covered, and a lock should be covered are transmitted to the item exclusive control section 19. the item column data 15 with which the item exclusive control section 19 was specified in response to it -- a lock -- applying -- an architect -- a principal -- by the item column edit editor 11, except cannot correct the item column data 15, and carries out it.

[0028] With the gestalt 2 of operation, the structure exclusive control section 7 is performing exclusive control at the time of correcting the item column data 15 shown in drawing 7 with the item column edit editor 11. As drawing 7 shows, in case the item column data 15 are corrected with the item column edit editor 11 in PDM12, by making to start the item column editor edit 11 into a trigger (cause), the exclusive control cooperation function part 10 goes the managed (meta) data 16 of the corresponding object to PDM12 to search, and specifies the three-dimension model 4 and drawing 5 in corresponding MDM8. And the three-dimension model 4 and drawing 5 which are set as the processing instruction over which a lock is covered, and the object of a lock and which were specified are transmitted to the structure exclusive control section 7. the three-dimension model 4 and drawing 5 with which the structure exclusive control section 7 was specified in response to it -- a lock -- applying -- an architect -- a principal -- except cannot check out a common space 3 and carries out the three-dimension model 4 and drawing 5 which were specified.

[0029] With the gestalt 2 of operation, the structure exclusive control section 7 and the item exclusive control section 19 perform exclusive control when the release level shown in drawing 8 is **** requesting. In MDM8, the architect who made correction throws the managed (meta) data 16 of an object used as a **** object into the **** workflow function part 13 on PDM12 after the completion of correction of the item column data 15 after the completion of correction of the three-dimension model 4 or a drawing 5, or in PDM12. By this data charge, release level becomes "a **** request." The exclusive control cooperation function part 10 specifies the three-dimension model 4, the drawing 5, and the item column data 15 which are linked to the managed (meta) data 16 of an object used as the supplied **** object by making this "**** request" into a trigger (cause). And a lock instruction on the three-dimension model 4 and drawing 5 on specified MDM8 is made into the structure exclusive control section 7. the three-dimension model 4 and drawing 5 with which the structure exclusive control section 7 was specified in response -- a lock -- applying -- an architect -- a principal -- except cannot check out a common space 3 and carries out the three-dimension model 4 and a drawing 5. Moreover, the exclusive control cooperation function part 10 makes a lock instruction to the item column data 15 on specified PDM12 the item exclusive control section 19. In response, the item exclusive control section 19 covers a lock over the specified item column data 15. It becomes impossible for nobody to correct to the three-dimension model 4, a drawing 5, or the item column data 15 by being locked by such control including the architect itself.

[0030] Moreover, with the gestalt 2 of operation, when **** request cancellation occurs in **** shown in drawing 9 , or when release level becomes **** ending, exclusive control is performed by the structure exclusive control section 7 and the item exclusive control section 19. As drawing 9 shows, when release level becomes [the **** workflow function part 13 on PDM12] "finishing [****]" into ****, Or carry out **** request cancellation by the architect (**** client), processing is performed, and the action is made into a trigger when release level becomes "under creation", as shown in drawing 5 . The exclusive control cooperation function part 10 gives the instruction of which the lock of the three-dimension model 4, the drawing 5, and the item column data 15 used as a **** object is canceled to the structure exclusive control section 7 and the item exclusive control section 19. In response, the structure exclusive control section 7 cancels the lock of the three-dimension model 4 and a drawing 5, and the item exclusive control section 19

cancels the lock of the item column data 15. Thus, also in a three-dimensional-CAD managerial system with complicated DS, the consistency of the data managed on a three-dimensional-CAD managerial system is maintainable because the structure exclusive control section 7 and the item exclusive control section 19 control exclusively by cooperating with the exclusive control cooperation function part 10. Moreover, by making it control exclusively by the item exclusive control section 19, the data which are made to control exclusively the data managed by the MDM system by the structure exclusive control section 7, and are managed by the PDM system can divert the exclusive control function of the existing PDM system managed unitary as it is, and can build the system corresponding to the three-dimension model 4. Namely, it is effective in the product management by the three-dimensional-CAD design system which raised the portability of a system and was excellent in building simply the three-dimension data management system MDM8 in a three-dimensional-CAD design and a cooperation system with PDM12 which manages down-stream arrangement data being attained.

[0031] Here, the vocabulary indicated above of "memorizing" means saving at a record medium. Moreover, although each above-mentioned processing (flow chart) is performed by the program, this program is recorded on the recording device, is read into a central processing unit (CPU) from a recording device, and is performed by the central processing unit. In addition, storage and ***** are not illustrating. Moreover, the software and the program of a gestalt of each operation may be realized by the firmware memorized by ROM (READ ONLY MEMORY). Or each function of the program mentioned above in the combination of software, a firmware, and hardware may be realized.

[0032]

[Effect of the Invention] According to the product information management equipment of this invention, a three-dimension model, a drawing, and item information can be locked at the time of the design of a three-dimension model, a drawing, and item information, consistency maintenance can be realized, and the system which attains upgrading of design operation and activity increase in efficiency can be built.

[0033] According to the product information management approach of this invention, at the time of the design of a three-dimension model, a drawing, and item information, a three-dimension model, a drawing, and item information can be locked, consistency maintenance can be realized, and upgrading of design operation and activity increase in efficiency can be attained.

[0034] Moreover, also when an inspection demand is made, it has the effectiveness that consistency maintenance of a three-dimension model, a drawing, and item information is realizable.

[0035] Moreover, in cancellation of termination of inspection, or an inspection demand, a three-dimension model, a drawing, and the lock of item information can be canceled, and data can be opened to other users.

[0036] Moreover, processing which realized consistency maintenance of a three-dimension model, a drawing, and item information can be performed on a computer by the product information management program of this invention.

[0037] Moreover, processing which maintains the above-mentioned consistency maintenance can be performed on a computer by the program which the computer read in the above-mentioned record medium through the record medium which recorded the product information management program of this invention, and in which computer reading is possible.

[Translation done.]

* NOTICES *

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.*** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

TECHNICAL FIELD

[Field of the Invention] This invention relates to the product information management equipment for maintaining the consistency of the drawing corresponding to a three-dimension model and a three-dimension model, and item information, and its approach.

[Translation done.]

* NOTICES *

JPO and NCIPJ are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

PRIOR ART

[Description of the Prior Art] Conventionally, in the design site of a manufacture, the product architect expressed the configuration and the dimension of the product as a two-dimensional drawing, and defines the bill of materials of the product as the item column on a drawing further. With the spread of computers, the product data management system (PDM:PRODUCT DATA MANAGEMENT) which manages a design result object at large as not paper but electronic data not only including a drawing but including electronic forms, such as a bill of materials, was realized, and the data of this item column have also been managed as "forward" by the PDM system in the design site. Here, "forward" means the data (usually newest) which an architect should make the object of a design. And in order to produce actually the drawing managed by this PDM system, and the product based on the data of the item column, the structure electronically transmitted to a down-stream production control system has been built. On this structure, GUI (GRAPHICAL USER INTERFACE) which inputs item column data is offered by the PDM system, an architect does not do a data input to the item column on a direct drawing, but data are inputted via this GUI, it is once held at PDM, and the method which sticks that item column data on a drawing electronically is realized. It is for protecting about this merit pouring the data which were mistaken by offering edit exchange functions, such as a function to carry out the automatic check of the mistaken components information not only in improvement in a throughput but in the item column input GUI, and to take out warning (warning), and a function which complements the components information on other only with putting in the part number automatically, to a down-stream production control system.

[0003] However, in case the point which serves as a technical problem by this structure has a design change, I hear that it is necessary to carry out data control of it, and there is so that mismatching may not occur by making drawing information and item column data into a couple. as the case where mismatching occurs -- an architect -- the example which the 3rd person edits a drawing by another reason, and mismatching cuts while a principal edits item column data, and its objection -- an architect -- while a principal edits a drawing, there is an example which the 3rd person edits item column data by another reason, and mismatching cuts. Since such a problem is coped with, the exclusive control function of an access privilege has been realized in the conventional PDM system. During drawing edit, this function is a function locked reversely [that] so that, as for under item column data editing, the others cannot access the drawing corresponding to it in lock **** so that the others cannot access the item column corresponding to it. Thus, by controlling exclusively, a drawing and the item column data corresponding to 1 to 1 have been managed as a pair.

[Translation done.]

* NOTICES *

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.*** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

EFFECT OF THE INVENTION

[Effect of the Invention] According to the product information management equipment of this invention, a three-dimension model, a drawing, and item information can be locked at the time of the design of a three-dimension model, a drawing, and item information, consistency maintenance can be realized, and the system which attains upgrading of design operation and activity increase in efficiency can be built.

[0033] According to the product information management approach of this invention, at the time of the design of a three-dimension model, a drawing, and item information, a three-dimension model, a drawing, and item information can be locked, consistency maintenance can be realized, and upgrading of design operation and activity increase in efficiency can be attained.

[0034] Moreover, also when an inspection demand is made, it has the effectiveness that consistency maintenance of a three-dimension model, a drawing, and item information is realizable.

[0035] Moreover, in cancellation of termination of inspection, or an inspection demand, a three-dimension model, a drawing, and the lock of item information can be canceled, and data can be opened to other users.

[0036] Moreover, processing which realized consistency maintenance of a three-dimension model, a drawing, and item information can be performed on a computer by the product information management program of this invention.

[0037] Moreover, processing which maintains the above-mentioned consistency maintenance can be performed on a computer by the program which the computer read in the above-mentioned record medium through the record medium which recorded the product information management program of this invention, and in which computer reading is possible.

[Translation done.]

* NOTICES *

JPO and NCIP1 are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] the three-dimension model for the complicated DS of a three dimension since it is necessary with the spread of three dimensional CAD (COMPUTER AIDED DESIGN) in recent years to set and manage not only a drawing but a three-dimension model on the other hand -- and -- and the system which can manage the drawing generated is needed. There is a three-dimensional-CAD data management system which manages the three-dimension model, drawing, a model tree, etc. (layered structure of a three-dimension model) called MDM (MODEL DATA MANAGEMENT) as the system. Then, it is possible to extract the model building tree data (model tree) of the three-dimension model which a MDM system manages, to divert the model tree by the PDM system side, and to relate with item column data by building the system which made the PDM system which existed from the former, and the MDM system cooperate.

[0005] however, in case the point which serve as a technical problem by the system which made this MDM system and a PDM system cooperate have a design change, I hear that it be necessary to carry out data control of it, and there be so that mismatching may not occur by make into a couple the item column data manage by the three dimension model [which be manage by the MDM system side], and information [on a drawing] and PDM system side. Since the exclusive control function of the access privilege of only the conventional drawing is what is simply realized [have / I / you] unitary by the single PDM system as described above, it does not have the exclusive control function of an access privilege in the system which made the PDM system and the MDM system cooperate. Therefore, when premised on three dimensional CAD, it becomes a technical problem to realize the exclusive control function of an access privilege when the complicated relation of the item column data managed by the three-dimension model and drawing, and PDM system side has been grasped. [which are managed by the MDM system side]

[0006] This invention aims at maintaining the consistency of the product information which has a three-dimension model, a drawing, and item information.

[Translation done.]

* NOTICES *

JPO and NCIP are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

MEANS

[Means for Solving the Problem] In order to attain the above-mentioned object, the product information management equipment which is this invention The structure information storage section which memorizes the two-dimensional drawing corresponding to the three-dimension model and three-dimension model in which the structure of the three dimension which consists of one or more components was shown on a structure table, The item information storage section memorized on an item table by making into item information information about one or more components of the three-dimension model which the above-mentioned structure information storage section memorizes, Access is accepted to the access request of 1 accessed for a design of either of the item information which the three-dimension model, the drawing, and the above-mentioned item information storage section which the above-mentioned structure information storage section memorizes memorize. It is characterized by having the exclusive control section which forbids accessing for a design of the item information which the three-dimension model, the drawing, and the above-mentioned item information storage section which the above-mentioned structure information storage section memorizes to other access requests memorize.

[0008] Moreover, the above-mentioned exclusive-control section is characterized by the thing which access for a design of the item information corresponding to the object of an access request among the item [which are accessed for a design of the three-dimension model which the above-mentioned structure information-storage section memorizes, the three-dimension model corresponding to the object of an access request among drawings, and a drawing / which carry out thing prohibition] information which the above-mentioned item information-storage section memorizes and do for thing prohibition to an access request besides the above.

[0009] Moreover, the above-mentioned exclusive-control section is characterized by to forbid accessing for a design of the item information which the three-dimension model, the drawing, and the above-mentioned item information-storage section which the above-mentioned structure information-storage section memorizes memorize, when an inspection demand is made after accessing for a design of either of the item information which the three-dimension model, the drawing, and the above-mentioned item information-storage section which the above-mentioned structure information-storage section memorizes memorize.

[0010] Moreover, the above-mentioned exclusive-control section carries out the thing access for the design by the item information corresponding to the object of an inspection demand among the item [which access for a design of the three-dimension model which the above-mentioned structure information-storage section memorizes, the three-dimension model corresponding to the object of an inspection demand among drawings, and a drawing / which carry out thing prohibition] information which the above-mentioned item information-storage section memorizes and do for thing prohibition as the description to the above-mentioned inspection demand.

[0011] Moreover, the above-mentioned exclusive control section is characterized by admitting accessing for a design of the item information which the three-dimension model, the drawing, and the above-mentioned item information storage section which the above-mentioned structure information storage section memorizes memorize in the case where the inspection to the above-mentioned inspection demand is completed, or when there being cancellation of an inspection demand.

[0012] Moreover, the product information management approach of this invention memorizes the two-dimensional drawing corresponding to the three-dimension model and three-dimension model in which the structure of the three dimension which consists of one or more components was shown on a structure table. It memorizes on an item table by making into item information information about one or more components of the three-dimension model which the above-mentioned structure table memorizes. Access is accepted to the access request of 1 accessed for a design of either of the item information which the three-dimension model and drawing which the above-mentioned structure table memorizes, and the above-mentioned item table memorize. It is characterized by forbidding accessing for a design of the item information which the three-dimension model and drawing which the above-mentioned structure table memorizes to other access requests, and the above-mentioned item table memorize.

[0013] Moreover, the processing which memorizes the two-dimensional drawing corresponding to the three-dimension model and three-dimension model in which the structure of a three dimension where the product information management program of this invention consisted of one or more components was shown on a structure table, The processing memorized on an item table by making into item information information about one or more components of the three-dimension model which the above-mentioned structure table memorizes, Access is accepted to the access request of 1 accessed for a design of either of the item information which the three-dimension model and drawing which the above-mentioned structure table memorizes, and the above-mentioned item table memorize. It is characterized by making a computer perform processing which forbids accessing for a design of the item information which the three-dimension model and drawing which the above-mentioned structure table memorizes to other access requests, and the above-mentioned item table memorize.

[0014] Moreover, the record medium which recorded the product information management program of this invention and in which computer reading is possible The processing which memorizes the two-dimensional drawing corresponding to the three-dimension model and three-dimension model in which the structure of the three dimension which consists of one or more components was shown on a structure table, The processing memorized on an item table by making into item information information about one or more components of the three-dimension model which the above-mentioned structure table memorizes, Access is accepted to the access request of 1 accessed for a design of either of the item information which the three-dimension model and drawing which the above-mentioned structure table memorizes, and the above-mentioned item table memorize. It is characterized by recording the product information management program which makes a computer perform processing which forbids accessing for a design of the item information which the three-dimension model and drawing which the above-mentioned structure table memorizes to other access requests, and the above-mentioned item table memorize.

[0015]
[Embodiment of the Invention] As the above-mentioned publication, conventionally, by inputting the item column data which are the bill of materials of the drawing created in a design category from the dedication GUI of a PDM system, it was managed unitary by the bill-of-materials function manager, and stuck on the drawing automatically as an item column after that, and the link to down-stream systems, such as a production control system, etc. was realized simultaneously. In the actual condition that a three-dimensional-CAD design spreads, as a form of the item column data which become the origin of production information, the model tree of three dimensional CAD 1 is diverted, item column data are completed by adding a missing component required for arrangement etc. to item column data, and carrier delivery of the consistent electronic data to a down-stream system is realized. Design increase in efficiency is attained by offering edit exchange functions, like saving the time and effort of an input, and edit of the item column data on this structure prevents an input mistake. However, it sets in the condition that the item column data once created newly are held at PDM. When the correction for a design change joins a three-dimension model and a drawing, the 3rd person corrects the item column data in a PDM system for the another object. Or when the correction for a design change joined item column data, the 3rd person corrected the three-dimension model and the drawing in a MDM system to the reverse for the another object, and the problem which the mismatching of data generates was in it. In order to solve such a problem, it controls exclusively by the gestalt of operation as follows, and the

consistency of the information on a PDM system and a MDM system is held with it.

[0016] gestalt 1. of operation -- the gestalt 1 of operation is explained first. In the three-dimensional-CAD data management system shown in drawing 1, MDM8 consists of a common space 3 (forward data sharing field) and a workspace 2 (each one of working areas). A common space 3 is an example of a structure table which memorizes the two-dimensional drawing 5 corresponding to the three-dimension model 4 and the three-dimension model 4 in which the structure of the three dimension which consists of one or more components was shown. A three-dimensional-CAD architect performs an input using three dimensional CAD 1, and carries out a three-dimensional-CAD design by making one's workspace 2 into a working area. The three-dimension model 4 in the event of a three-dimension design being completed and an example of a drawing 5 are shown in drawing 2. An architect makes the three-dimension model 4 on his workspace 2 check in at the three-dimension model 4 of a common space 3, and makes the drawing 5 on his workspace 2 check in at the drawing 5 of a common space 3. Here, it says that the check-in shown in drawing 1 moves data to a common space 3 (share data area) from a workspace 2 (each one of working areas). Moreover, it says that the check-out shown in drawing 1 moves data to a workspace 2 (each one of working areas) from a common space 3 (share data area). The model tree 6 generated from the three-dimension model 4, or the drawing 5 and the three-dimension model 4 at which he checked in is held as forward data at a common space 3. The example of the model tree 6 generated by drawing 2 from the three-dimension model 4, the drawing 5, and the three-dimension model 4 is given. As for the data on a common space 3, the access control is performed by setting out of an access privilege being made by every user's (user) authority.

[0017] On the other hand, the management (meta) information 16 on the data of the three-dimension model 4 and drawing 5 in MDM8 or the data of the item information in PDM12 is held at the database 14 in PDM12. Although the attribute of data, a semantic content, a customer, a storing location, etc. say the information for managing data in the managed (meta) data 16, in this system, the address of a three-dimension model name, a drawing name, the file name that memorized the three-dimension model 4 and the drawing 5, and a physical file location folder, an architect name, a design date and an acknowledgement person name, an acknowledgement date, etc. correspond, for example. Moreover, the item column data 15 with the item information which showed the information about one or more components of the three-dimension model 4 memorized by the common space which is an example of a structure table to the database 14 in PDM12 are held. This item column data 15 is an example of an item table. Moreover, the item information on this item column data 15 consists of one hierarchy who has the relation between parents and a child, and can be edited by the item column edit editor 11. Using the data extraction function part 9, the data extracted from the model tree 6 of MDM8 were incorporated as initial value at the time of edit, and the item column edit editor 11 has diverted them. This item column edit editor 11 may exist independently, as shown in drawing 1, and although not illustrated, it may exist as a function on PDM12. Moreover, the item column data 15 in PDM12 are constituted by the components information (PARTS STRUCTURE) PN 17 and the components configuration information (PARTS NUMBER) PS 18. Moreover, the **** workflow function part 13 of PDM12 has the function which inspects and attests the three-dimension model 4 and drawing 5 which were designed when there was a **** (inspection and authentication) demand from an architect, and the item column data 15.

[0018] The case where an architect checks out the three-dimension model 4 or drawing 5 of a common space 3 on MDM8 to a workspace 2, and the exclusive control section 20 changes these contents, When writing is put into the item column data 15 in which the item information on PDM12 is shown, Or when an architect requests **** (inspection and authentication) of either the above-mentioned three-dimension model 4, a drawing 5 and the item column data 15, other architects and users have the function to forbid writing in the three-dimension model 4, a drawing 5, and the item column data 15. Moreover, the exclusive control section 20 has the function to cancel the prohibition on the writing to the three-dimension model 4, a drawing 5, and the item column data 15 to other architects and users, when termination of **** is checked, and when cancellation of a **** request is checked. Thus, the exclusive control section 20 can maintain the consistency of the three-dimension model 4 of MDM8, a drawing 5, the model tree 6, and the item column data 15 on PDM12 by controlling exclusively.

[0019] Next, each actuation (1) - (8) shown in drawing 3 is concretely explained about by what kind of flow

among the whole configurations shown by above-mentioned drawing 1, how, the data extraction function part 9 functions, and the item column data 15 are edited.

- (1) Generate the model tree 6 from the three-dimension model 4 designed by three dimensional CAD 1. The image 29 in MDM8 shown in drawing 3 is an example of the model tree 6.
- (2) The model tree 6 on MDM8 is extracted on PDM12 using the data extraction function part 9. The image 30 in PDM12 after the data extraction shown in drawing 3 is an example of the extracted model tree 6, and is the same content as an image 29.
- (3) By the item column edit editor 11, divert the extracted model tree 6 as a form, and edit the item column data 15.
- (4) Save the item column data 15 after edit at PDM12.
- (5) In correcting the item column data 15, the item column data 15 are read into the item column edit editor 11 from PDM12, and it performs a reorganization collection.
- (6) Stick the edit result by the item column edit editor 11 as an item column 27 on the drawing 5 of three dimensional CAD 1.
- (7) Moreover, the three-dimension viewdata and the link of a graphics server (not shown) where the model tree 6 in PDM12 manages three-dimension viewdata separately are stretched. It is for the third party who wants to check the content of a design to refer to easily the three-dimension model 4, a drawing 5, and the item column data 15.
- (8) Moreover, the item column data 15 (PN17/PS18) which edit completed are linked to the down-stream production control system.

[0020] Below, drawing 4 is explained. The **** workflow function part 13 holds the release level of drawing 4, and it is shown whether the three-dimension model 4, a drawing 5, and the item column data 15 are in which condition. When release level "is creating", level 1 and release level "are **** requesting" for example, and level 2 and release level are "finishing [****]", it is possible to manage like level 3 with the **** workflow function part 13. In the case of the condition in the middle of designing the three-dimension model 4, a drawing 5, or the item column data 15, release level becomes "under creation." A design is completed and release level becomes "under a **** request" the case in the condition that the object (the three-dimension model 4, a drawing 5, item column data 15) is supplied to the **** workflow function part 13. Ending the inspection authentication by the **** workflow function part 13, release level becomes "finishing [****]" the case in the condition, finishing [a release].

[0021] Drawing 5 is drawing showing the timing as which the **** workflow function part 13 determines release level. After creating the three-dimension model 4, a drawing 5, or the item column data 15 and ending creation, an architect supplies an object to the **** workflow function part 13. Then, the **** workflow function part 13 carries out release level "during a **** request." Release level will become "finishing [****]", if inspection and authentication are completed by the **** workflow function part 13 and it will be in the condition of **** O.K. In reforming the three-dimension models 4, such as setting-out modification, a drawing 5, or the item column data 15, in order to borrow an object [finishing / a release], release level becomes "under creation." Moreover, when there is a cancellation request of the object supplied on the **** workflow function part 13 when release level had become "under the **** request", release level becomes "under creation" "out of a **** request."

[0022] Next, concrete actuation of the exclusive control section 20 is explained. Drawing 6 is the flow chart which showed actuation of the exclusive control section 20 at the time of correcting the three-dimension model 4 and a drawing 5. As shown in drawing 6, in case he checks out a common space 3 and the three-dimension model 4 and a drawing 5 are corrected in a workspace 2 by MDM8, as shown in drawing 4, I am checked out as "under creation" in the release level of an object. That is, as shown in drawing 5, an object [finishing / a release] is borrowed from a common space 3 in a workspace 2, and a design change is performed by correcting the data in a workspace 2. When temporarily checked out with the condition of "finishing [****]" which release level shows to drawing 5, there is no correction and it is judged as the object of only reference. When it is judged that a correction act is performed after borrowing an object [finishing / a release / for the case of the former, i.e., amendment,], the exclusive control section 20 goes

the managed (meta) data 16 of the object to PDM12 to search by making the action [say / having checked out object data from the common space 3 (forward data sharing field) of MDM8 to the workspace 2 (each one of working areas)] into a trigger. and the item column data 15 corresponding to the object -- a lock -- applying -- an architect -- a principal -- by the item column edit editor 11, except cannot correct the item column data 15, and carries out it. Thus, also in the three-dimensional-CAD managerial system in which the exclusive control section 20 has complicated DS by controlling exclusively, other architects can be forbidden from correcting freely the item column data 15 on PDM12 during correction of the three-dimension model 4 and a drawing 5, and the consistency of each data (three-dimension model 4, drawing 5, and item column data 15) with which it is related on a three-dimensional-CAD managerial system can be maintained. It becomes possible to utilize three-dimension model 4, drawing 5, and the item column data 15 with which forward was guaranteed by the newest in an instant by this doubling not only with the conventional mere data transmission but with design operation cooperation between the three-dimension data management system MDM8 in a three-dimensional-CAD design, and PDM12 which manages down-stream arrangement data, and realizing implementation of consistency maintenance of various data. Therefore, if this cooperation system of MDM8 and PDM12 is used, upgrading of design operation (a three-dimensional-CAD design and arrangement directions operation) and activity increase in efficiency are realizable.

[0023] Drawing 7 is the flow chart which showed actuation of the exclusive control section 20 at the time of correcting the item column data 15 using the item column edit editor 11. As drawing 7 shows, in case the item column data 15 are corrected by the item column edit editor 11 in PDM12, it makes to start the item column editor edit 11 into a trigger (cause). The exclusive control section 20 goes the managed (meta) data 16 of the corresponding item column data 15 to PDM12 to search. the three-dimension model 4 and drawing 5 in corresponding MDM8 -- a lock -- applying -- an architect -- a principal -- except cannot check out a common space 3 and carries out the three-dimension model 4 and a drawing 5. Thus, also in the three-dimensional-CAD managerial system in which the exclusive control section 20 has complicated DS by controlling exclusively, other architects can be forbidden from correcting freely the three-dimension model 4 and drawing 5 on MDM8 during correction of the item column data 15, and the consistency of each data (three-dimension model 4, drawing 5, and item column data 15) with which it is related on a three-dimensional-CAD managerial system can be maintained.

[0024] Drawing 8 is the flow chart which showed the actuation which the exclusive control section 20 performs, when release level is **** requesting. Here, as release level shows drawing 4 R 4 during a **** request, a design is completed and the condition that the object is supplied to the **** workflow function part 13 is said. Moreover, an object here means the three-dimension model 4, a drawing 5, or the item column data 15. In MDM8, the architect who made correction throws the managed (meta) data 16 of an object used as a **** object into the **** workflow function part 13 on PDM12 after the completion of correction of the item column data 15 after the completion of correction of the three-dimension model 4 or a drawing 5, or in PDM12. By this data charge, release level becomes "a **** request" and the exclusive control section 20 specifies the three-dimension model 4, the drawing 5, and the item column data 15 which are linked to the managed (meta) data 16 of an object used as the supplied **** object by making this "**** request" (= data charge) into a trigger (cause). And a lock is covered over the three-dimension model 4 and drawing 5 on specified MDM8, he cannot check out a common space 3 and the three-dimension model 4 and a drawing 5 are carried out. Moreover, a lock is covered also over the item column data 15 on specified PDM12. It becomes impossible thus, for nobody to correct including the architect itself because the exclusive control section 20 covers a lock over the three-dimension model 4, a drawing 5, or the item column data 15. Thus, at the time of a **** request, also in a three-dimensional-CAD managerial system with complicated DS, the exclusive control section 20 can maintain the consistency of the three-dimension model 4 of MDM8, a drawing 5, the model tree 6, and the item column data 15 on PDM12, and can perform an exact production control by controlling exclusively so that nobody can correct the object for ****.

[0025] Drawing 9 is the flow chart with which the **** workflow function part 13 showed the actuation which the exclusive control section 20 performs when **** request cancellation occurred in ****, or when release level became **** ending. As drawing 9 shows, when release level becomes [the **** workflow function part

13 on PDM12] "finishing [****]" into ****, Or carry out **** request cancellation by the architect (**** client), processing is performed, and the action is made into a trigger when release level becomes "under creation", as shown in drawing 5 . The exclusive control section 20 cancels the lock of the three-dimension model 4, the drawing 5, and the item column data 15 of PDM12 used as a **** object. Thus, when release level becomes "finishing [****]", a refer right can be granted to all men because the exclusive control section 20 controls exclusively. moreover, the case where release level becomes "under creation" -- an implementer (architect) -- an access privilege (a refer right and right of correction) can be granted only to a principal.

[0026] Gestalt 2. of operation, next the gestalt 2 of operation are explained. Although drawing 10 is the almost same system configuration as the three-dimensional-CAD data management system shown in drawing 1 , a exclusive control function distributes in MDM8 and PDM12, and it exists. That is, the structure exclusive control section 7 exists on MDM8, and the item exclusive control section 19 exists on PDM12. Moreover, the exclusive control cooperation function part 10 with the function to take the timing which considers exclusive control as the function to specify the object of exclusive control has joined the component. The above structure exclusive control section 7, item exclusive control section 19, and exclusive control cooperation function part 10 are performing the same control as the exclusive control section 20 of the gestalt 1 of operation. Other configurations are the same as the configuration of drawing 1 . The structure exclusive control section 7 has the function to lock or cancel the data held at the three-dimension model 4, the drawing 5, and the model tree 6 on a common space 3, and controls an access privilege by this. Moreover, the item exclusive control section 19 has the function to lock or cancel the data held at the PN data 17 and the PS data 18 of the item column data 15, and controls an access privilege by this. The exclusive control cooperation function part 10 moreover, at the time of a design change A design-change object is specified using the managed (meta) data 16 which held the relation of the three-dimension model 4 in MDM8, a drawing 5, and the item column data 15 in PDM12 as information. When correction starts three-dimension model 4 and the drawing 5 in MDM8, the timing and the user actuation trigger for starting the processing which covers a lock over the item column data 15 in PDM12 are clarified, and it has a cooperation function for realizing a series of processings in an operation flow. Moreover, when correction starts the item column data 15 in PDM12, the timing and the user actuation trigger for starting the processing which covers a lock over three-dimension model 4 and the drawing 5 in MDM8 are clarified, and it has a cooperation function for realizing a series of processings in an operation flow. Moreover, at the time of a **** request, if the managed (meta) data 16 of the three-dimension model 4, a drawing 5, or the item column data 15 are made into **** written request voice within PDM12 The three-dimension model 4, the drawing 5, and the item column data 15 which are set as the **** objects, such as the three-dimension model 4 and drawing 5 of MDM8, and the item column data 15 of PDM12, are locked. The timing and the user actuation trigger for starting the processing which controls the others' access exclusively are clarified, and it has a cooperation function for realizing a series of processings in an operation flow. Moreover, the timing and the user actuation trigger for starting the processing which carries out automatic removal of the lock of the after [**** termination] or three-dimension model 4 which **** request cancellation is carried out and is data for **** behind, a drawing 5, or the item column data 15 are clarified, and it has a cooperation function for realizing a series of processings in an operation flow.

[0027] Concrete actuation of exclusive control is explained. With the gestalt 2 of operation, the item exclusive control section 19 is performing exclusive control at the time of correcting the three-dimension model 4 and drawing 5 which are shown in drawing 6 . Namely, as shown in drawing 6 , when you check out a common space 3 and the three-dimension model 4 and a drawing 5 are corrected in a workspace 2 by MDM8, When it is judged that he checks out an object [finishing / a release] from a common space 3 to a workspace 2, and a correction act is performed, the exclusive control cooperation function part 10 The item column data 15 which serve as a design-change object using the managed (meta) data 16 are specified. The action [say / having checked out object data from the common space 3 (forward data sharing field) of MDM8 to the workspace 2 (each one of working areas)] is made into a trigger. The specified item column data 15 over which the processing instruction over which a lock is covered, and a lock should be covered are transmitted to the item

exclusive control section 19. the item column data 15 with which the item exclusive control section 19 was specified in response to it -- a lock -- applying -- an architect -- a principal -- by the item column edit editor 11, except cannot correct the item column data 15, and carries out it.

[0028] With the gestalt 2 of operation, the structure exclusive control section 7 is performing exclusive control at the time of correcting the item column data 15 shown in drawing 7 with the item column edit editor 11. As drawing 7 shows, in case the item column data 15 are corrected with the item column edit editor 11 in PDM12, by making to start the item column editor edit 11 into a trigger (cause), the exclusive control cooperation function part 10 goes the managed (meta) data 16 of the corresponding object to PDM12 to search, and specifies the three-dimension model 4 and drawing 5 in corresponding MDM8. And the three-dimension model 4 and drawing 5 which are set as the processing instruction over which a lock is covered, and the object of a lock and which were specified are transmitted to the structure exclusive control section 7. the three-dimension model 4 and drawing 5 with which the structure exclusive control section 7 was specified in response to it -- a lock -- applying -- an architect -- a principal -- except cannot check out a common space 3 and carries out the three-dimension model 4 and drawing 5 which were specified.

[0029] With the gestalt 2 of operation, the structure exclusive control section 7 and the item exclusive control section 19 perform exclusive control when the release level shown in drawing 8 is **** requesting. In MDM8, the architect who made correction throws the managed (meta) data 16 of an object used as a **** object into the **** workflow function part 13 on PDM12 after the completion of correction of the item column data 15 after the completion of correction of the three-dimension model 4 or a drawing 5, or in PDM12. By this data charge, release level becomes "a **** request." The exclusive control cooperation function part 10 specifies the three-dimension model 4, the drawing 5, and the item column data 15 which are linked to the managed (meta) data 16 of an object used as the supplied **** object by making this "**** request" into a trigger (cause). And a lock instruction on the three-dimension model 4 and drawing 5 on specified MDM8 is made into the structure exclusive control section 7. the three-dimension model 4 and drawing 5 with which the structure exclusive control section 7 was specified in response -- a lock -- applying -- an architect -- a principal -- except cannot check out a common space 3 and carries out the three-dimension model 4 and a drawing 5. Moreover, the exclusive control cooperation function part 10 makes a lock instruction to the item column data 15 on specified PDM12 the item exclusive control section 19. In response, the item exclusive control section 19 covers a lock over the specified item column data 15. It becomes impossible for nobody to correct to the three-dimension model 4, a drawing 5, or the item column data 15 by being locked by such control including the architect itself.

[0030] Moreover, with the gestalt 2 of operation, when **** request cancellation occurs in **** shown in drawing 9, or when release level becomes **** ending, exclusive control is performed by the structure exclusive control section 7 and the item exclusive control section 19. As drawing 9 shows, when release level becomes [the **** workflow function part 13 on PDM12] "finishing [****]" into ****, Or carry out **** request cancellation by the architect (**** client), processing is performed, and the action is made into a trigger when release level becomes "under creation", as shown in drawing 5. The exclusive control cooperation function part 10 gives the instruction of which the lock of the three-dimension model 4, the drawing 5, and the item column data 15 used as a **** object is canceled to the structure exclusive control section 7 and the item exclusive control section 19. In response, the structure exclusive control section 7 cancels the lock of the three-dimension model 4 and a drawing 5, and the item exclusive control section 19 cancels the lock of the item column data 15. Thus, also in a three-dimensional-CAD managerial system with complicated DS, the consistency of the data managed on a three-dimensional-CAD managerial system is maintainable because the structure exclusive control section 7 and the item exclusive control section 19 control exclusively by cooperating with the exclusive control cooperation function part 10. Moreover, by making it control exclusively by the item exclusive control section 19, the data which are made to control exclusively the data managed by the MDM system by the structure exclusive control section 7, and are managed by the PDM system can divert the exclusive control function of the existing PDM system managed unitary as it is, and can build the system corresponding to the three-dimension model 4. Namely, it is effective in the product management by the three-dimensional-CAD design system which raised the portability of a

system and was excellent in building simply the three-dimension data management system MDM8 in a three-dimensional-CAD design and a cooperation system with PDM12 which manages down-stream arrangement data being attained.

[0031] Here, the vocabulary indicated above of "memorizing" means saving at a record medium. Moreover, although each above-mentioned processing (flow chart) is performed by the program, this program is recorded on the recording device, is read into a central processing unit (CPU) from a recording device, and is performed by the central processing unit. In addition, storage and ***** are not illustrating. Moreover, the software and the program of a gestalt of each operation may be realized by the firmware memorized by ROM (READ ONLY MEMORY). Or each function of the program mentioned above in the combination of software, a firmware, and hardware may be realized.

[Translation done.]

* NOTICES *

JPO and NCIP are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the whole three-dimensional-CAD data management system block diagram.

[Drawing 2] It is an example of a three-dimension model, a drawing, and a model tree.

[Drawing 3] It is an example of a system management which cooperated the MDM system and the PDM system.

[Drawing 4] It is the explanatory view of the release level of an object.

[Drawing 5] A **** workflow function part is the timing chart which determines release level.

[Drawing 6] It is flow chart drawing showing the exclusive control section at the time of correcting a three-dimension model and a drawing.

[Drawing 7] It is flow chart drawing showing the exclusive control section at the time of correcting item column data.

[Drawing 8] It is flow chart drawing showing the exclusive control section under **** request.

[Drawing 9] It is flow chart drawing showing the exclusive control section in **** ending or **** request cancellation.

[Drawing 10] It is the whole three-dimensional-CAD data management system block diagram with the two exclusive control sections.

[Description of Notations]

1 Three Dimensional CAD, 2 Workspace, 3 Common Space, 4 A three-dimension model, 5 A drawing, 6 A model tree, 7 Structure exclusive control section, 8 MDM, 9 A data extraction function part, 10 Exclusive control cooperation function part, 11 An item column edit editor, 12PDM, 13 **** workflow function part, 14 A database, 15 Item column data, 16 Managed (meta) data, 17 PN, 18 PS, 19 The item exclusive control section, 20 Exclusive control section, 22 Viewdata management, 27 The item column, 28 which were stuck on the drawing It is a drawing under design, and 29 on three dimensional CAD. The image of the model tree in MDM, 30 Image of the model tree in PDM after data extraction.

[Translation done.]

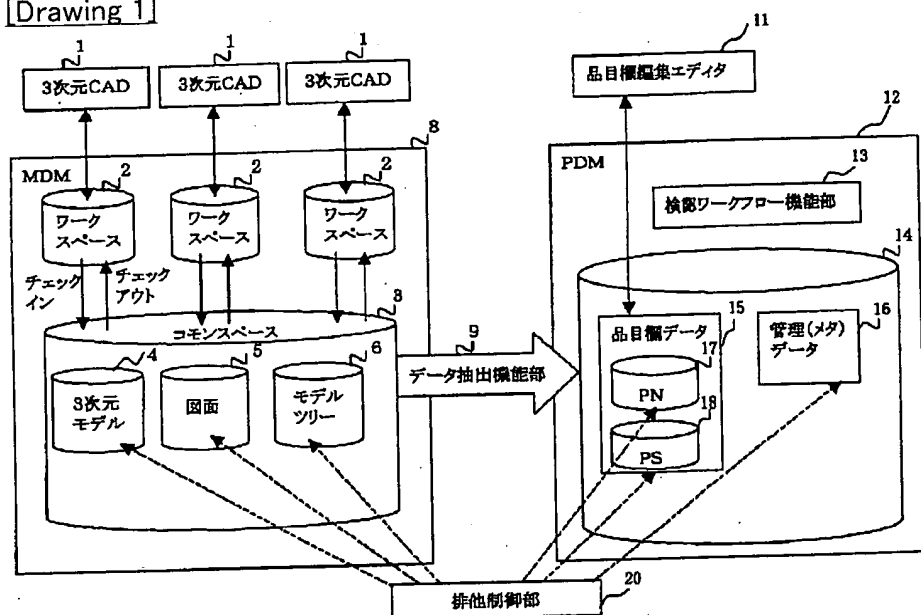
* NOTICES *

JPO and NCIP are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.*** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DRAWINGS

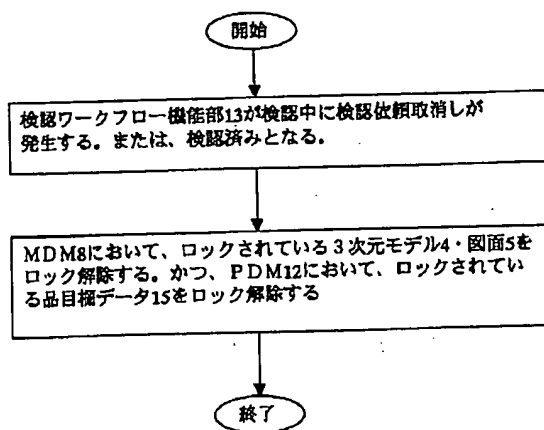
[Drawing 1]



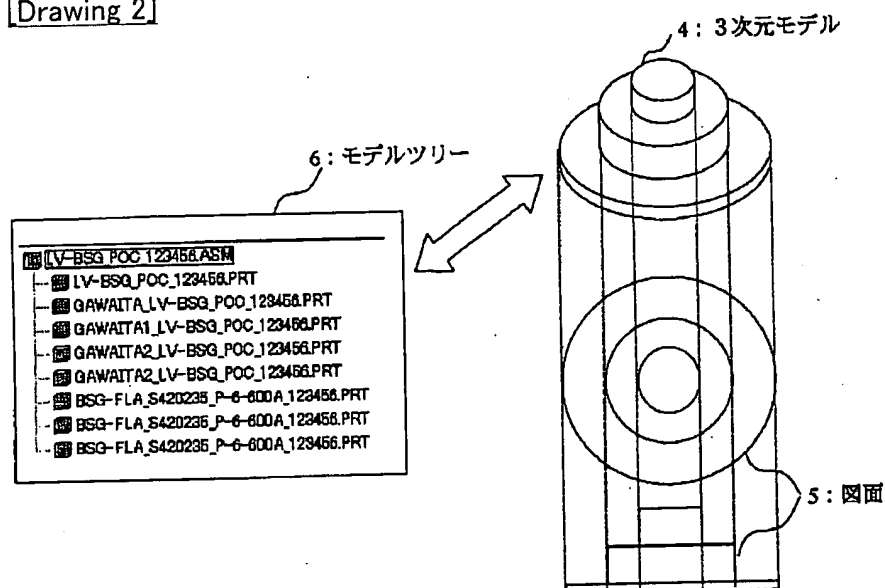
[Drawing 4]

リリースレベル	状態
作成中	設計途中の状態
検閲依頼中	設計が完了し、オブジェクトが検閲ワークフロー機能部 13 に投入されている状態
検閲済み	検閲ワークフロー機能部 13 での検閲OK処理を完了、リリース済みの状態

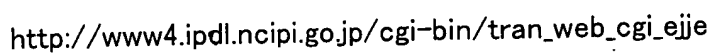
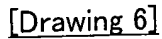
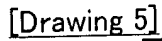
[Drawing 9]



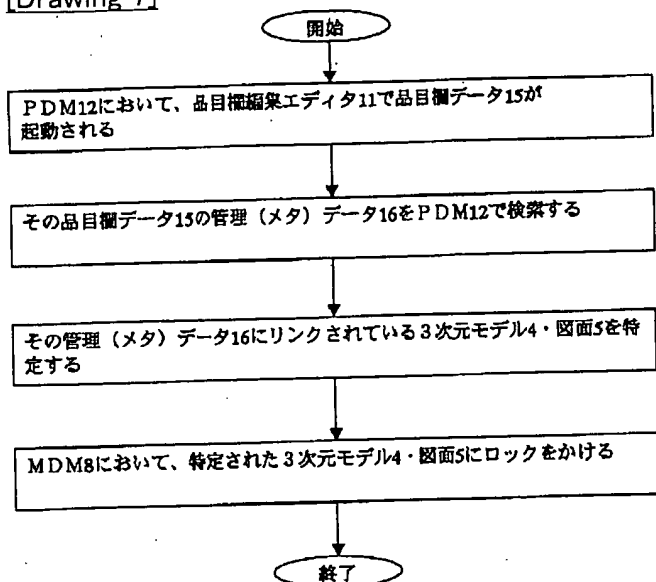
[Drawing 2]



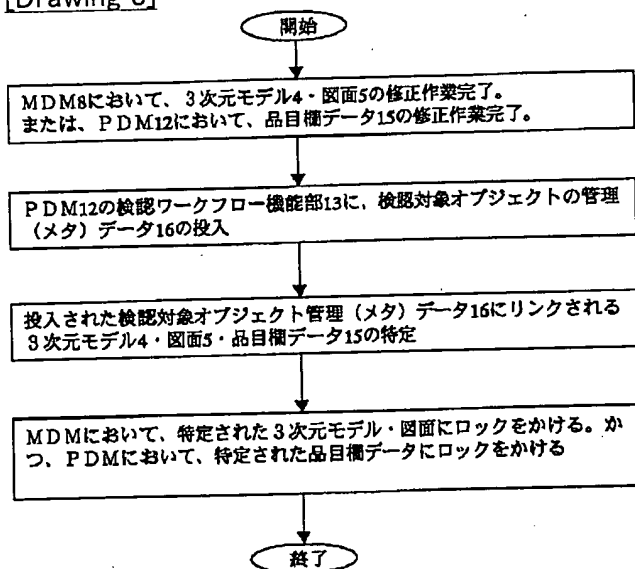
[Drawing 3]



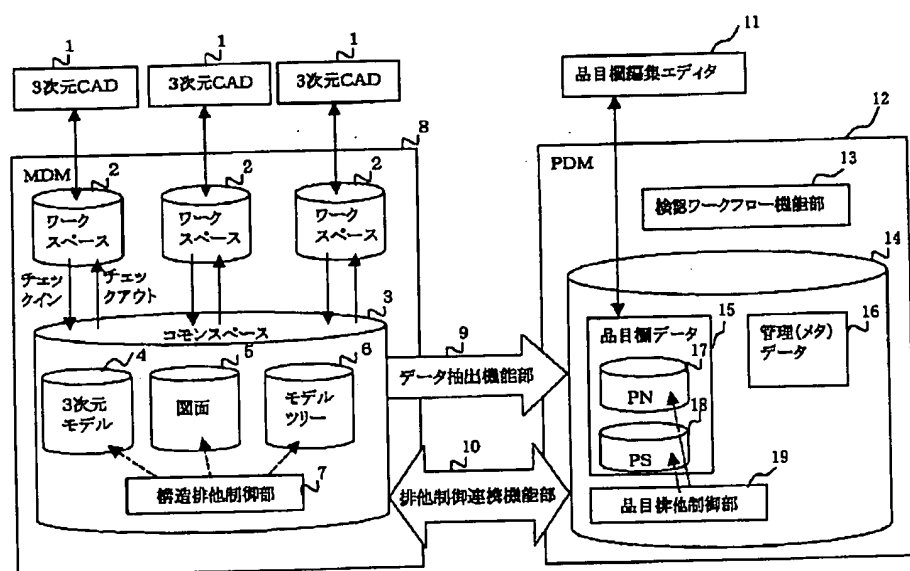
[Drawing 7]



[Drawing 8]



[Drawing 10]



[Translation done.]

This Page is inserted by IFW Indexing and Scanning Operations and is not part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☒ BLACK BORDERS
- ☒ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
- ☐ FADED TEXT OR DRAWING
- ☐ BLURED OR ILLEGIBLE TEXT OR DRAWING
- ☐ SKEWED/SLANTED IMAGES
- ☒ COLORED OR BLACK AND WHITE PHOTOGRAPHS
- ☐ GRAY SCALE DOCUMENTS
- ☒ LINES OR MARKS ON ORIGINAL DOCUMENT
- ☐ REPERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY
- ☐ OTHER: _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning documents *will not* correct images problems checked, please do not report the problems to the IFW Image Problem Mailbox